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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,544	02/05/2004	Maki Hoshino	040302-0379	2816

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EXAMINER

HENDRICKSON, STUART L

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/771,544	<b>Applicant(s)</b> HOSHINO, MAKI	
	<b>Examiner</b> Stuart Hendrickson	<b>Art Unit</b> 1754	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 8-12 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takamura 6,548,034 in view of Arntz 5,364,984.

Takamura '034 teaches a method of reducing the carbon monoxide concentration of a mixed gas containing hydrogen, CO and oxygen with a Pt catalyst (see column 4, lines 4-13) and the gas is supplied at 100 – 100,000 [1/h] (see column 4, lines 59-62) at a temperature of 40°C to 200°C. Takamura does not discuss the CO adsorption amount. It appears possessed since some examples use 1% Pt, which is exactly the amount used by most of the examples of the present specification. Also, Arntz '984 discloses a platinum metal catalyst with CO adsorption of 0.5 to 1.6 ml of CO/g of catalyst (see column 3, lines 50-55, column 6, lines 5-9, and claim 4, column 10, lines 3-7). It can be seen from the amount of Pt and the capacity of Arntz that the catalyst of Takamura is expected to meet this limitation. As to claim 2, the Takamura '034 process provides a feed stream whereby the carbon monoxide concentration is about 1 mol% (col. 5, lines 33-36). The oxygen is 0.5 to 4 times the CO concentration (see col. 4, lines 55-57).

As to claim 3, Takamura '034 discloses that the carbon monoxide reducing catalyst can have at least one metal selected from cobalt, nickel, copper or manganese (column 5, lines 6-9).

As to claim 8, in Takamura '034, the carbon monoxide reducing catalyst is a monolithic catalyst (see ex. 2 in col. 8, and col. 4, lines 4-37 showing a supported catalyst). The amount of the second component appears to fall within the range of 2g or less per liter of the monolithic catalyst (see col. 4, lines 45-49, as compared to example 1 in the present disclosure). The source of claims 9 and 10 does not in and of itself distinguish the actual gas composition. No difference of any consequence is seen between claim 1 and 12.

Claims 1-5, 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura.

Takamura discloses a broad range of amounts for the first and second component (see column 4, lines 45-49). It would have been obvious to one of ordinary skill in the art at the time

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the invention was made to vary the amounts catalyst so as to arrive at the claimed ratios and material, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. See, e.g., In re Boesch, 617 F.2d 272, 205 U.S.P.Q. 215 (CCPA 1980). The artisan would have been motivated to vary the amount of the second component of the catalyst because varying it would optimize the amount of carbon monoxide adsorbed, while reducing the cost of the catalyst.

As to claim 5, comparative example 3 in column 8 of Takamura teaches that ruthenium can be used as a carbon monoxide oxidation catalyst. See also column 5, lines 13-14.

As to claim 8- if the amount is different- then it is an obvious expedient to use the claimed amount to optimize performance with expense.

As to claims 9 and 10, the mixed gas supply in the Takamura '034 process is reformed gas obtained by reforming a fuel containing a hydrocarbon (see column 3, lines 41-44). In any event, treating a CO containing gas from any source is an obvious expedient, as long as the composition itself is similar.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura '034 taken with Arntz '984 as applied to claims 1-5 and 8-12 above, and further in view of USP 6,913,739 to Shore.

As to claims 6 and 7, Takamura '034 does not teach that the second component is a rare earth. Shore '739 teaches the use of a rare earth metal as a catalyst (see column 3, lines 57-61). Shore '739 further discloses that the rare earth metal can be lanthanum, cerium, neodymium, and praseodymium (see column 5, line 64 – column 6, line 5). As cerium (and other rare earth metals) are known to be effective, yet less expensive preferential oxidation catalysts (see column 3, lines 11-16), it would have been obvious to one of ordinary skill in the art to combine the rare earth metal catalyst component of Shore '739 with the catalyst composition of Takamura '034 in order to reduce the carbon monoxide composition in a gas stream effectively with reduced cost. It is further noted than when A is known (transition metal) and B (rare earth

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metal) is known to perform a function (carbon monoxide oxidation), then A and B together is obvious. See, e.g., In re Kerkhoven, 205 U.S.P.Q. 1069 (CCPA 1980).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura '034 taken with Arntz '984 as applied to claims 1-5 and 8-12 above, and further in view of USP 3,584,608 to Shibagaki.

As to claim 10, Takamura '034 teaches that the carbon monoxide containing gas can be supplied by a process for reforming hydrogen methanol, et cetera (see column 1, lines 11-15); therefore, Takamura '034 suggests that it does not matter where the detrimental carbon monoxide containing gas stream comes from. However, Takamura does not explicitly disclose reducing the carbon monoxide concentration from the exhaust stream of an internal combustion engine. Shibagaki discloses removing detrimental components such as carbon monoxide within the exhaust gas of an internal combustion engine (see column 1, lines 35 – 51). As such, it would have been obvious to one of ordinary skill in the art at the time of this invention to use the Takamura process to reduce the carbon monoxide concentration in a carbon monoxide containing gas stream from an internal combustion engine, as in Shibagaki, in order to remove these detrimental components as desired in both Takamura and Shibagaki.

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to examiner Hendrickson at telephone number (571) 272-1351.



Stuart Hendrickson  
examiner Art Unit 1754